

Claims

What is claimed is:

1. (currently amended) A tri-mode over-voltage circuit protection and disconnect apparatus, the apparatus comprising:

a. a first over-voltage protection circuit disposed between a hot line and a ground line;

b. a second and a third over-voltage protection circuit disposed between the hot line
5 and a neutral line; and

c. a fourth over-voltage protection circuit disposed between the neutral line and the ground line;

d. a warning means for indicating that the input hot line and neutral line are reversed;
and

e. at least one warning means for indicating that an over-voltage condition has
10 occurred, the at least one warning means being selected from a group of warning means
consisting of an indicator light, an LED indicator, and an audible alarm;

whereby the hot line and the neutral line are distributed as an output voltage when the over-voltage protection circuits are functioning, and

15 whereby, in the event of an over-voltage condition between the hot line and neutral line the second and third over-voltage protection circuits respond by passing sufficient current to cause at least one protective device to open, wherein the protective device is selected from a
group consisting of fast-blow fuse, slow-blow fuse, thermal fuse, and circuit breaker,
wherein each of the over-voltage protection circuit comprises

20 a. a thermal fuse and

b. a metal oxide varistor (MOV),

wherein the thermal fuse associated with the first over-voltage protection circuit is
disposed in parallel with the ground line and hot line,

wherein the thermal fuse associated with the second over-voltage protection circuit is
25 disposed in series with the neutral line,

wherein the thermal fuse associated with the third over-voltage protection circuit is
disposed in series with the hot line,

30 wherein the thermal fuse associated with the fourth over-voltage protection circuit is
disposed in parallel with the ground line and neutral line,
 wherein the MOV associated with the first over-voltage protection circuit is disposed
in parallel with the hot line and the ground line,
 wherein the MOV associated with the second over-voltage protection circuit is disposed
in parallel with the hot line and the neutral line,
35 wherein the MOV associated with the third over-voltage protection circuit is disposed
in parallel with the hot line and the neutral line,
 wherein the MOV associated with the fourth over-voltage protection circuit is disposed
in parallel with the neutral line and the ground line,
 whereby the first over-voltage protection circuit being disposed in a manner facilitating
40 response to an over-voltage condition occurring between the hot line and the ground line,
 whereby the second and third over-voltage circuits being disposed in a manner
facilitating response to an over-voltage condition occurring between the hot line and the neutral
line, and
 whereby the fourth over-voltage protection circuit being disposed in a manner
45 facilitating response to an over-voltage condition occurring between the neutral line and the
ground line.

2-4 (canceled)

5. (original) A tri-mode over-voltage protection and disconnect circuit apparatus as recited in claim 1, further comprising at least one electronic interference filter.

6. (previously amended) The apparatus as recited in claim 5 further comprising at least one protective device selected from a group consisting of fast-blow fuse, slow-blow fuse, thermal fuse, and circuit breaker.

7. (currently amended) A tri-mode over-voltage protection and disconnect circuit apparatus, the apparatus comprising:

a. a first over-voltage protection circuit disposed between a hot line and a ground line;

b. a second and a third over-voltage protection circuit disposed between the hot line and
5 a neutral line;

c. a fourth over-voltage protection circuit disposed between the neutral line and the ground line; and

d. at least one warning means for indicating that an over-voltage condition has occurred and a protective device has operated, the at least one warning means being selected from a
10 group of warning means consisting of an indicator light, an LED indicator, and an audible alarm

wherein each of the over-voltage protection circuits comprises:

a. a thermal fuse; and

b. a respective metal oxide varistor (MOV).

wherein the thermal fuse associated with the first over-voltage protection circuit is
15 disposed in parallel with the ground line and hot line,

wherein the thermal fuse associated with the second over-voltage protection circuit is
disposed in series with the neutral line,

wherein the thermal fuse associated with the third over-voltage protection circuit is
20 disposed in series with the hot line,

wherein the thermal fuse associated with the fourth over-voltage protection circuit is
disposed in parallel with the ground line and neutral line,

wherein the respective MOV associated with the first over-voltage protection circuit is
disposed in parallel with the hot line and the ground line,

wherein the respective MOV associated with the second over-voltage protection circuit
25 is disposed in parallel with the hot line and the neutral line,

wherein the respective MOV associated with the third over-voltage protection circuit
is disposed in parallel with the hot line and the neutral line,

wherein the respective MOV associated with the fourth over-voltage protection circuit
30 is disposed in parallel with the neutral line and the ground line; and

whereby the respective MOV associated with the fourth over-voltage protection circuit
being disposed in a manner facilitating response to an over-voltage condition occurring
between the neutral line and the ground line.

8. (canceled)

9. (previously amended) The apparatus as recited in claim 7 wherein the protective device is selected from a group consisting of fast-blow fuse, slow-blow fuse, thermal fuse, and circuit breaker.

10. (original) A tri-mode over-voltage protection and disconnect circuit apparatus as recited in claim 7, further comprising at least one electronic interference filter.

11. (currently amended) A tri-mode over-voltage protection and disconnect circuit apparatus, the apparatus comprising:

a. a first over-voltage protection means disposed between a hot line and a ground line;

b. a second and third over-voltage protection means disposed between the hot line and a neutral line; and

c. a fourth over-voltage protection means disposed between the neutral line and the ground line,

whereby, in the event of an over-voltage condition on the hot line, the second and third over-voltage protection means respond by each opening a thermal protective device, thereby causing an open state such that the hot line and the neutral line are not distributed as an output voltage,

wherein each of the over-voltage protection means comprises:

a. a thermal fuse, and

b. a respective metal oxide varistor MOV,

wherein the thermal fuse associated with the first over-voltage protection circuit is disposed in parallel between the hot line and the ground line,

wherein the thermal fuse associated with the second over-voltage protection circuit is disposed in series with the neutral line,

wherein the thermal fuse associated with the third over-voltage protection circuit is disposed in series with the hot line,

wherein the thermal fuse associated with the fourth over-voltage protection circuit is disposed in parallel between the neutral line and the ground line,

wherein the respective MOV associated with the first over-voltage protection circuit is disposed in parallel with the hot line and the ground line,

wherein the respective MOV associated with the second and third over-voltage protection circuits are disposed in parallel with the hot line and the neutral line, and

whereby the respective MOV associated with the fourth over-voltage protection circuit being disposed in a manner facilitating response to an over-voltage condition occurring between the neutral line and the ground line.

12. (canceled)

13. (previously presented) The apparatus, as recited in Claim 1, further comprising:

a warning means for indicating that the input hot line and neutral line are reversed; and
at least one warning means for indicating that an over-voltage condition has occurred,
the at least one warning means being selected from a group of warning means consisting
essentially of an indicator light, an LED indicator, and an audible alarm.

14. (previously amended) The apparatus as recited in claim 11 further comprising at least one protective device selected from a group consisting of fast-blow fuse, slow-blow fuse, thermal fuse, and circuit breaker.

15. (original) A tri-mode over-voltage protection and disconnect circuit apparatus as recited in claim 11, further comprising at least one electronic interference filter.

16. (previously presented) A method of protecting at least one peripheral device from an over-voltage condition, the method comprising:

providing a tri-mode over-voltage protection and disconnect circuit apparatus, the apparatus comprising:

- a. a first over-voltage protection circuit disposed between a hot line and a ground line;
- b. a second and a third over-voltage protection circuit disposed between the hot line and a neutral line; and

c. a fourth over-voltage protection circuit disposed between the neutral line and the ground line;

the apparatus providing AC power to the at least one peripheral device,

whereby the hot line and the neutral line are not distributed as an

5 output voltage when the second and third over-voltage protection devices has opened a protective device.

17. (previously presented) The method, as recited in Claim 16, further comprising:

providing a warning means for indicating that the input hot line and neutral line are reversed; and

5 providing at least one warning means for indicating that an over-voltage condition has occurred, the at least one warning means being selected from a group of warning means consisting essentially of an indicator light, an LED indicator, an audible alarm; and

warning that an over-voltage condition has occurred by activating the provided warning feature.

18. (previously presented) The method of claim 17 further comprising providing an electronic interference filter on the input of the apparatus.

19. (original) The method of claim 16 further comprising providing an electronic interference filter on the output of the apparatus.